

## **INDIANA STATE DEPARTMENT OF HEALTH**

### **2011 Firework-Related Injury Report**

Through the passage of House Enrolled Act 1131, the Indiana State Department of Health (ISDH) received reports about injuries resulting from fireworks and/or pyrotechnics during 2003 and 2004. However, no reporting occurred in 2005 due to the expiration of this law. With the passage of Public Law 187 in 2006, reporting of firework-related injuries was reinstated with identical reporting requirements to those in the previous statute. All hospitals, medical facilities, and private medical practices are mandated by law to report all firework injuries and deaths to ISDH. This report presents firework-related injury data compiled from submitted firework reporting forms for 2011.

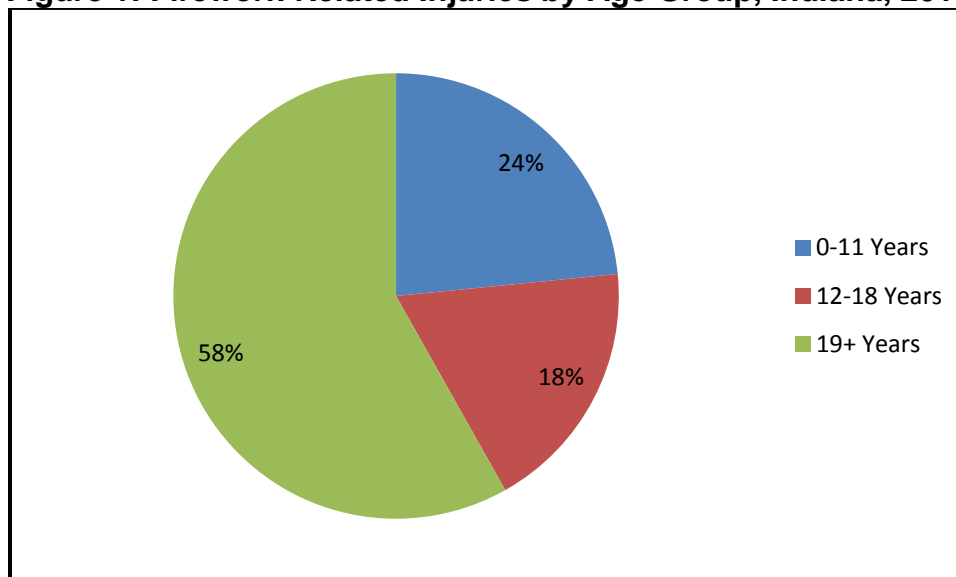
#### **Highlights for 2011**

- As of September 12, 2011 there were 141 unduplicated cases of firework-related injuries reported to ISDH.
- Almost half (41.8%, 63/134) of all reported firework-related injuries involved children and adolescents (individuals 18 years of age and under), who represent 25% of Indiana's population (US Census Bureau, 2009).
- Fifty-five percent (55.3%, 88/159) of firework-related injuries were burns with the hand and/or fingers being the most commonly affected body part.
- Nearly 12 percent (11.9%, 14/117) of injured persons were hospitalized or transferred to another hospital for treatment.
- Eyes injuries accounted for 18.3% of the total number of injuries (33/180); almost all (93.9%, 31/33) of those injured did not have or use eye protection.
- Over half of the injuries (51.0%, 73/143) were caused by firecrackers, rockets, and aerials.
- Malfunction and mishandling of fireworks accounted for 48.9% (69/141) of reported fireworks injury mechanisms.
- Firework use on private property accounted for 66.9% (89/133) of reported injuries.

## Demographics

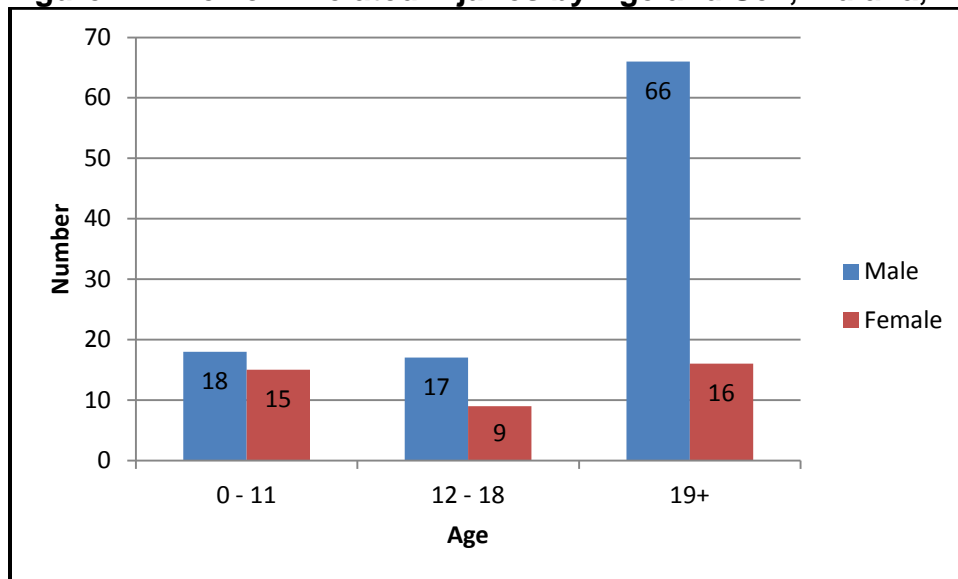
- The median age of persons with a firework-related injury was 21 years. The average age of all injured persons was 23.4 years with an age range from 0 to 65 years.
- Nearly forty-two percent (41.8%, 59/141) of those injured were 18 years of age or younger (Figure 1).
- Of reported injuries, 71.6% (101/141) involved males while 28.4% (40/141) involved females. Across all age groups, males reported more firework-related injuries than females (Figure 2).
- Over eighty percent (83.8%, 114/136) of persons injured were white, 11.8% (16/136) were black, and one (0.74%) was multiracial (Figure 3). Race was unknown for 3.7% (5/136) of the cases and was not recorded in five of the injury reports. Almost half of the injury reports did not record ethnicity (62/141). Of those who reported ethnicity, Hispanic ethnicity was reported in 5% (4/79) of the injured population.

**Figure 1: Firework-Related Injuries by Age Group, Indiana, 2011**



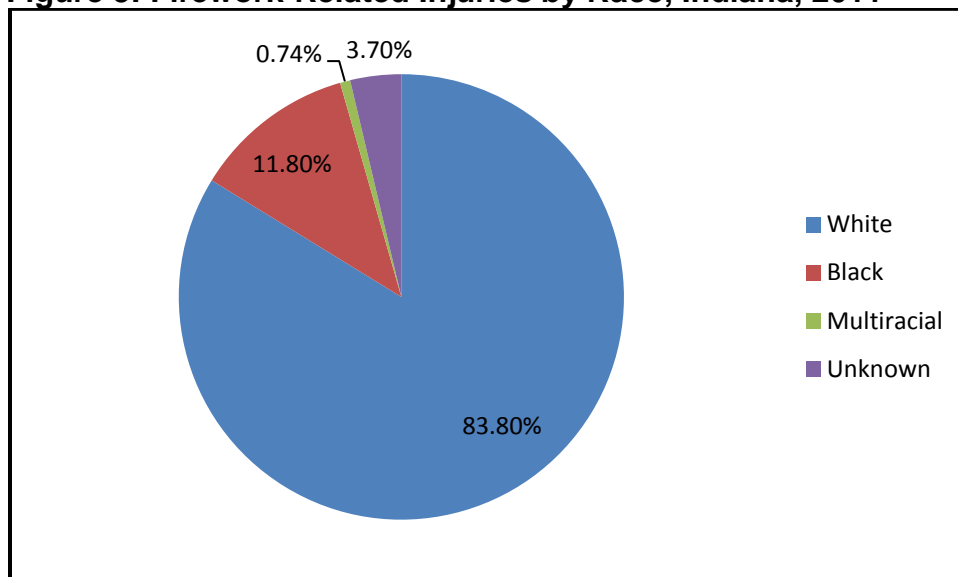
Source: Indiana State Department of Health, Injury Prevention Program

**Figure 2: Firework-Related Injuries by Age and Sex, Indiana, 2011**



Source: Indiana State Department of Health, Injury Prevention Program

**Figure 3: Firework-Related Injuries by Race, Indiana, 2011**

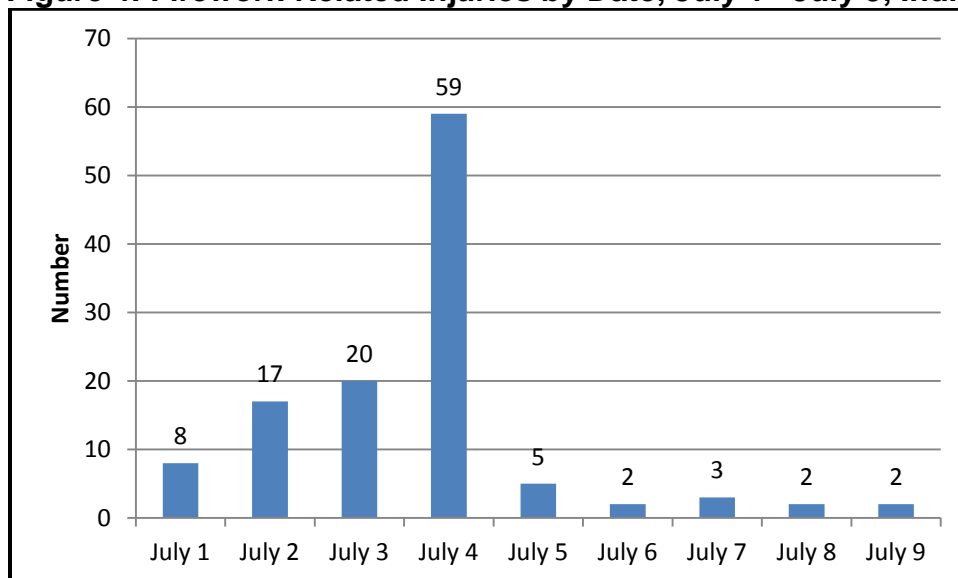


Source: Indiana State Department of Health, Injury Prevention Program

## Date and Time of Injuries

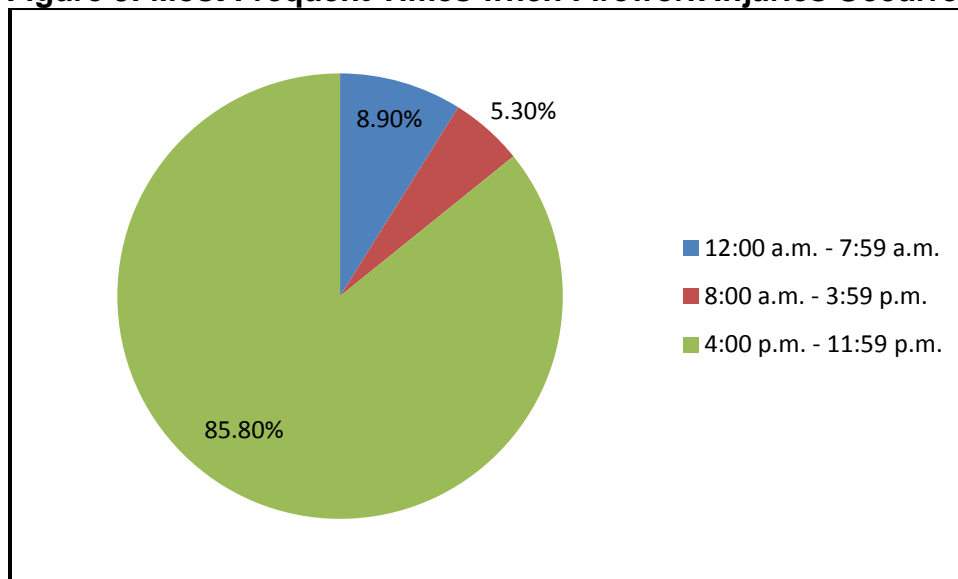
- Eleven injuries due to fireworks were reported in the first half of 2011 (January – June; 8.2%, 11/135). Nearly 90% (87.4%, 118/135) of all reported injuries occurred during the period July 1 – 9, 2011 (Figure 4); 43.7% (59/135) of all fireworks injuries for 2011 occurred on July 4.
- Well over three-quarters (85.8%, 97/113) of all injuries occurred between 4:00 p.m. and midnight (Figure 5). (Only 113 of the 141 records for all of 2011 recorded the time the injury occurred.)

**Figure 4: Firework-Related Injuries by Date, July 1– July 9, Indiana, 2011**



Source: Indiana State Department of Health, Injury Prevention Program

**Figure 5: Most Frequent Times when Firework Injuries Occurred, Indiana, 2011**



Source: Indiana State Department of Health, Injury Prevention Program

## Type of Fireworks Involved in Injuries

- The 141 individuals were injured by 143 fireworks, as two individuals were injured by more than one type of firework.
- Rockets, firecrackers, and aerial devices accounted for over half (51%, 73/143) of the types of fireworks most cited causing injury (Table 1).
- Malfunction and mishandling of fireworks accounted for almost half (48.9%, 69/141) of reported problems causing injury (Figure 6).

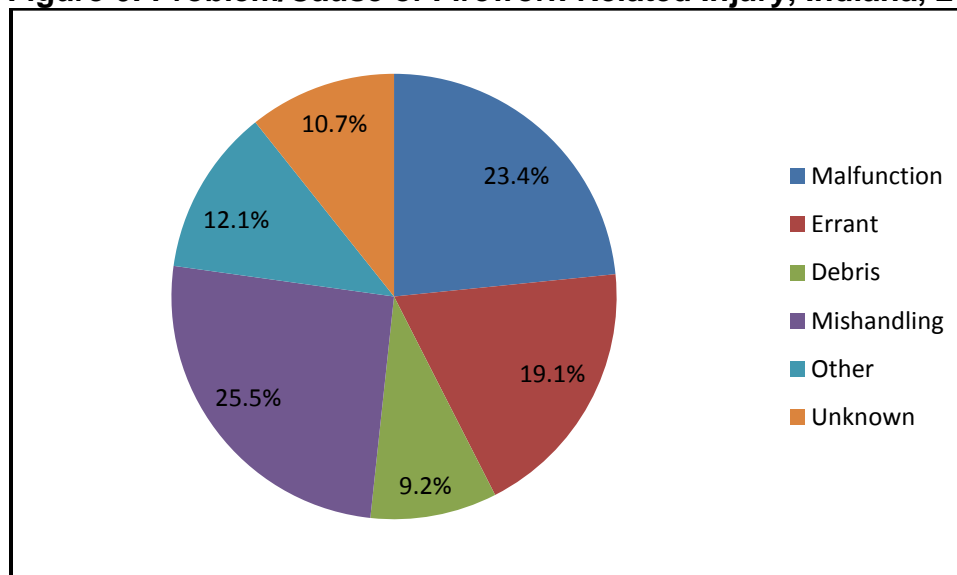
**Table 1: Frequency and Percent of Firework Type Involved in Injury, Indiana, 2011**

| Firework Type      | Frequency  | Percent        |
|--------------------|------------|----------------|
| Firecrackers       | 26         | 18.2%          |
| Rockets            | 25         | 17.5%          |
| Other              | 24         | 16.8%          |
| Aerial             | 22         | 15.4%          |
| Sparkler           | 17         | 11.9%          |
| Unknown            | 15         | 10.5%          |
| Twisters           | 9          | 6.3%           |
| Homemade fireworks | 4          | 2.8%           |
| Pyrotechnics       | 1          | 0.7%           |
| Gunpowder          | 0          | 0.0%           |
| <b>Total</b>       | <b>143</b> | <b>100.1%*</b> |

Source: Indiana State Department of Health, Injury Prevention Program

\*All percentages do not add up to 100% due to rounding.

**Figure 6: Problem/Cause of Firework-Related Injury, Indiana, 2011**

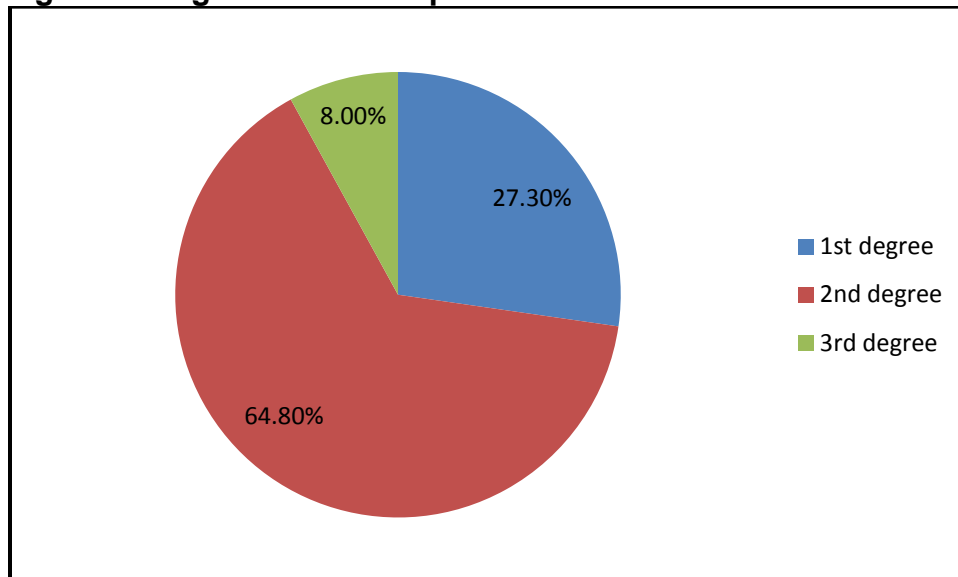


Source: Indiana State Department of Health, Injury Prevention Program

## Type of Injuries

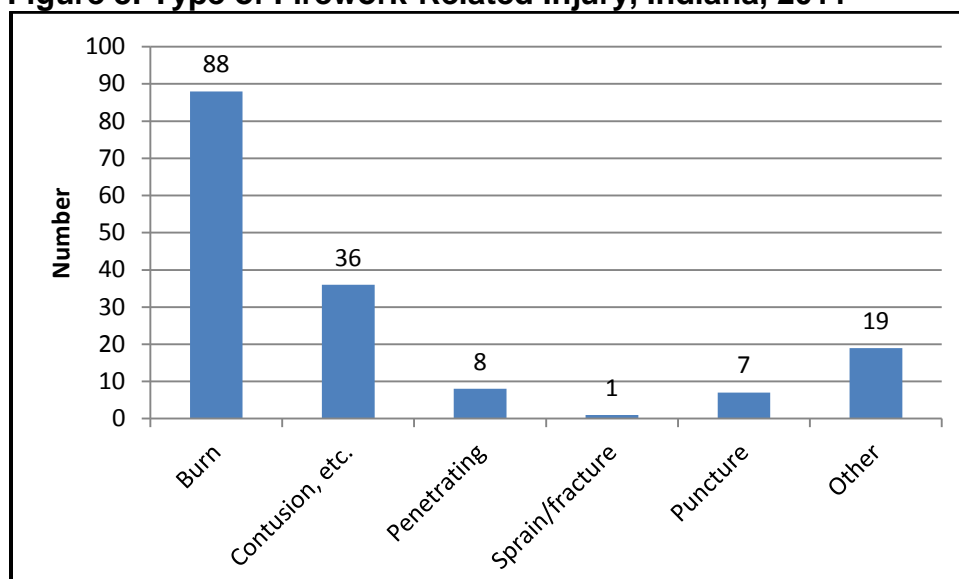
- In 2011 there were 159 total fireworks injuries occurring in 141 individuals. Of those injuries,
  - there were 88 burn injuries (55.3%, 88/159) reported that
    - 24 (27.3%, 24/88) were first-degree burns
    - 57 (64.8%, 57/88) were second-degree burns
    - 7 (8.0%, 7/88) were third-degree burns (Figure 7)
- Other types of injuries included contusions/lacerations/abrasions (22.6%, 36/159), penetrating foreign body/missiles (5.0%, 8/159), sprains/fractures (0.6%, 1/159), puncture wounds (4.4%, 7/159), and other injuries (12.0%, 19/159) (Figure 8).

**Figure 7: Degree of Burn Experienced from Firework-Related Injury, Indiana, 2011**



Source: Indiana State Department of Health, Injury Prevention Program

**Figure 8: Type of Firework-Related Injury, Indiana, 2011**

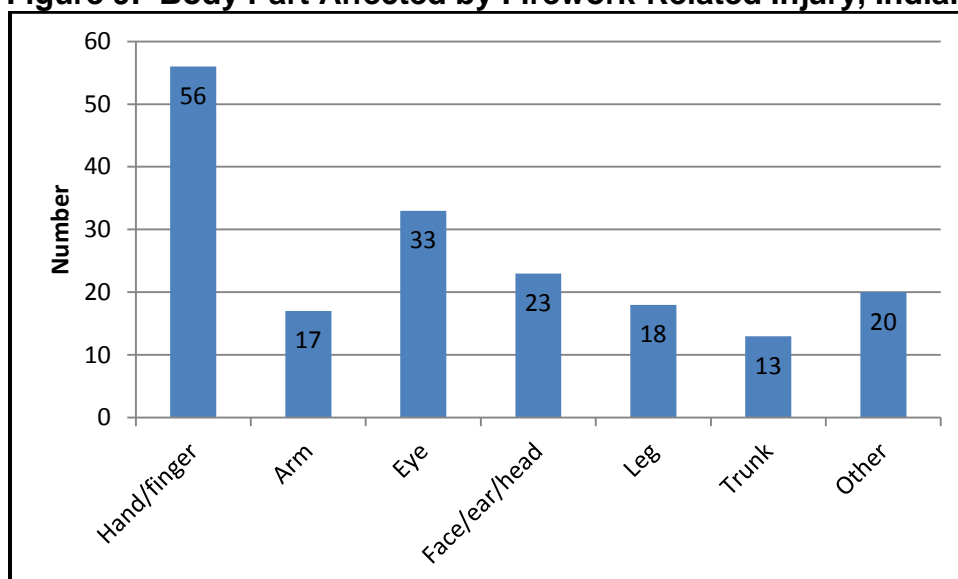


Source: Indiana State Department of Health, Injury Prevention Program

### **Body Part Injured**

- Of the 141 total cases, 17% (24/141) individuals experienced multiple injuries.
- Over half (58.8%, 106/180) of the injuries involved the hand/finger, eye or arm (Figure 9). Injuries to the face/ear/ head accounted for 12.8% (23/180); injuries to the leg accounted for 10.0% (18/180); injuries to the trunk, 7.2% (13/180); and other injuries (including foot, back, buttock, shoulder) accounted for 11.1% (20/180).
- Of those who had eye injuries, nearly all of those injured (93.3% [31/33]) did not have or use eye protection (i.e. glasses or contact lenses). Eye glasses were present in 3.0% (1/33) of the cases, while contact lenses were used by 9.1% (3/33) of those who experienced an eye injury.

**Figure 9: Body Part Affected by Firework-Related Injury, Indiana, 2011**



Source: Indiana State Department of Health, Injury Prevention Program

### Source of Care and Injury Outcomes

- The majority (81.6%, 115/141) of people injured by fireworks sought care at an emergency department. Of the remaining cases, 7.8% (11/141) sought care at an urgent care center; 7.1% received care from a provider office (i.e., pediatrician, optometrist); in 5 of the cases (3.5%, 5/141) the facility or provider was not identified.
- Nearly ninety percent (88.0%, 103/117) of those seeking treatment were evaluated and released to go home. However, 11.94 % (14/117) were admitted to the hospital or transferred to another hospital. Twenty-four (17.0%, 24/141) records did not provide information regarding the patient's outcome.

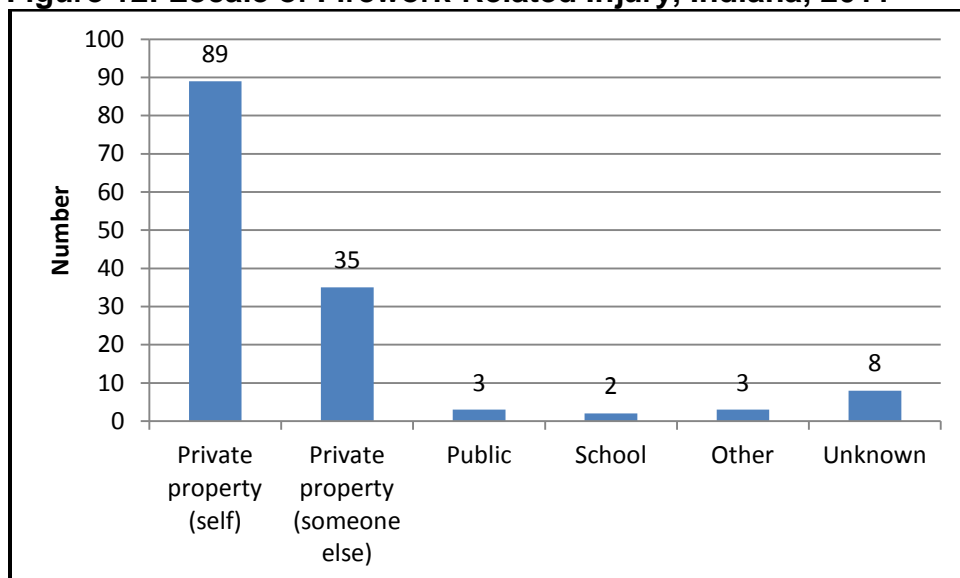
### Other Information

- Nearly seventy percent (66.9%, 89/133) of people were injured at their own private home/ yard/property while 26.3% (35/133) were injured at someone else's home/yard/property (Figure 12). Public property was noted as the site for 2.3% (3/133) of injury occurrences. Two injuries (1.5%, 2/133) occurred at schools. Three people were injured at other, unspecified locations (2.3%, 3/133) and injury location information was unknown for 8 people.
- Of injured persons, 10.6% (15/141) indicated that they were bystanders. Children and adolescents under 18 years of age made up 46.7% (7/15) of the bystanders injured by fireworks.
- Over eighty percent (85.8%, 121/141) of all reports did not provide information on alcohol consumption (Figure 13). Alcohol use was reported in 14.1% (20/141) of cases with 45.0% (9/20) of those cases reporting alcohol use within three hours of injury. None of those using alcohol were under 21 years of age.



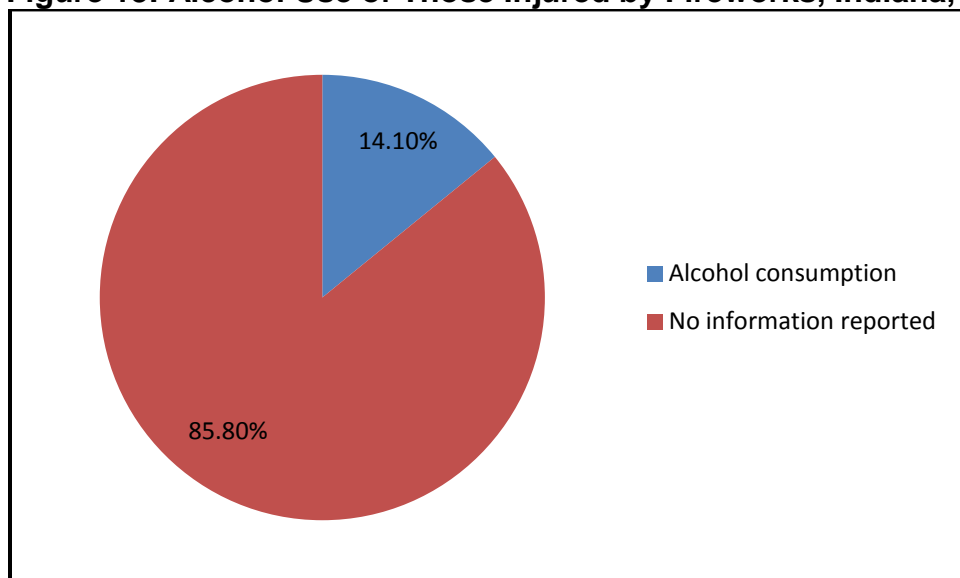
- Among those injured who were 18 years of age or less, 87.0% (47/54) were injured while in the presence of an adult; 5.5% (3/54) had no adult supervision. In four of the cases (7.4%, 4/54) information regarding adult supervision was not recorded (Figure 14).

**Figure 12: Locale of Firework-Related Injury, Indiana, 2011**



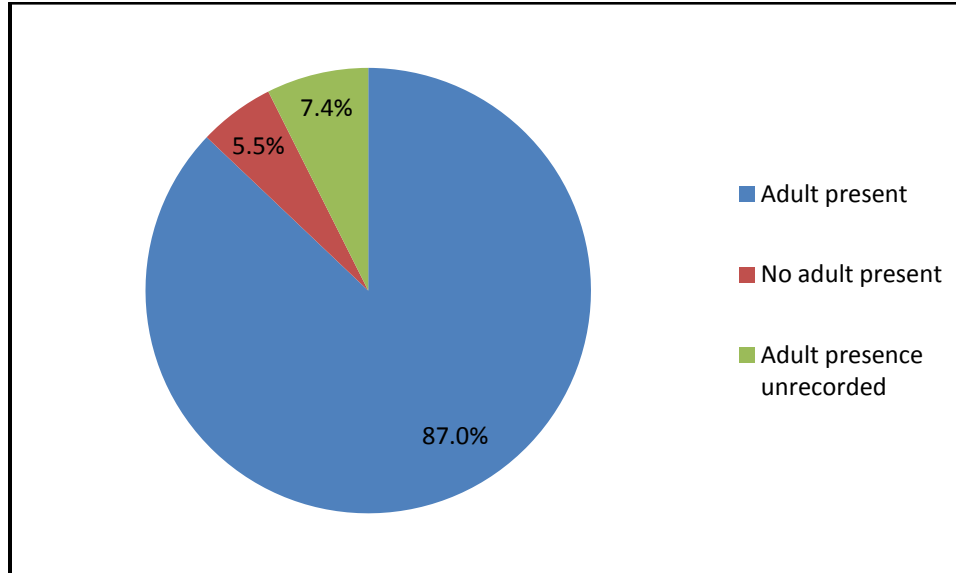
Source: Indiana State Department of Health, Injury Prevention Program

**Figure 13: Alcohol Use of Those Injured by Fireworks, Indiana, 2011**



Source: Indiana State Department of Health, Injury Prevention Program

**Figure 14: Adult Supervision of Individuals 18 Years of Age or Younger, Indiana, 2011**



Source: Indiana State Department of Health, Injury Prevention Program

### **Summary of Firework-Related Injuries for 2011**

While the ages of those injured ranged from 1 to 65 years, children and adolescents comprised almost half (47.0%, 63/134) of reported cases. Males (75.4%, 101/134) were injured more often than females (24.6%, 33/134). Almost three-quarters (73.1%, 98/134) of the cases were white, 15.7% (21/134) were black, two cases (1.5%) was multiracial and thirteen cases were unknown (9.7%).

Over half (58.8%, 114/194) of the injuries involved the hands/fingers, eyes or arms. Burns were the most common type of injury. The majority (83.6%, 112/134) of people injured by fireworks sought care at an emergency department, with the remaining cases (16.4%, 22/134) seeking medical care from another type of provider. Of those seeking medical care, 82.1% (110/134) were evaluated and released to go home. However, 16.4 % (22/134) were admitted to the hospital or transferred to another hospital.

For the 134 cases of firework-related injuries, 79.9% (107/134) occurred between July 2 and July 6 with 42.5% (57/134) of injuries taking place on July 4. Over half (53.7%, 72/134) of injuries occurred on private property. Firecrackers, rockets, and aerials (53.3%, 72/135) were cited most often as being involved in firework injuries. The cause of injury was most commonly malfunction and mishandling (51.8%, 73/141) of fireworks.

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## APPENDIX

### Firework-Related Injury Year Comparisons

The Indiana State Department of Health began receiving firework injury reports in 2003 after the collection of this information was mandated by law. After two years the law expired and no reports were collected in 2005. In 2006, the law was reinstated with requirements identical to the previous law. Table 2 shows the comparison of firework-related injuries for the years in which reporting was mandated (2003, 2004, 2006, 2007, 2008, 2009, and 2011).

**Table 2: Comparison of Firework-Related Injuries, Indiana, 2003-2004 and 2006-2011**

| Year   | 2003 | 2004 | 2006 | 2007 | 2008 | 2009   | 2010 | 2011 |
|--|------|------|------|------|------|--------|------|------|
| <b>Number of cases reported</b>                    | 261  | 233  | 251  | 156  | 141  | 116    | 134  | 141  |
| <b>Demographics</b>                                |      |      |      |      |      |        |      |      |
| Median Age   | 18   | 18   | 17   | 20   | 21   | 19     | 20   | 21   |
| Age Range (in years)                               | 0-74 | 0-72 | 0-67 | 0-70 | 0-70 | 0-81   | 1-69 | 0-65 |
| Children/Adolescents                               | 53%  | 52%  | 55%  | 48%  | 50%  | 50%    | 47%  | 42%  |
| Males  | 73%  | 76%  | 70%  | 67%  | 70%  | 72%    | 75%  | 72%  |
| Females  | 27%  | 24%  | 30%  | 33%  | 30%  | 28%    | 25%  | 28%  |
| White  | 84%  | 87%  | 82%  | 87%  | 73%  | 82%    | 73%  | 84%  |
| Black or African American                          | 10%  | 8%   | 13%  | 7%   | 14%  | 7%     | 16%  | 12%  |
| <b>Injury Type</b>                                 |      |      |      |      |      |        |      |      |
| Burns  | 76%  | 67%  | 73%  | 69%  | 65%  | 61%    | 62%  | 55%  |
| <b>Body Part Injured</b>                           |      |      |      |      |      |        |      |      |
| Hand   | 34%  | 32%  | 36%  | 41%  | 33%  | 37%    | 27%  | 31%  |
| Eye  | 17%  | 25%  | 29%  | 24%  | 21%  | 16%    | 17%  | 18%  |
| No Eye Protection                                  | 82%  | 88%  | 97%  | 92%  | 76%  | 91%    | 91%  | 93%  |
| <b>Injury Circumstances</b>                        |      |      |      |      |      |        |      |      |
| Injured on Private Property                        | 83%  | 89%  | 86%  | 83%  | 87%  | 84%    | 79%  | 67%  |
| Children Injured with Adults Present               | 60%  | 50%  | 64%  | 61%  | 62%  | 41.4 % | 57%  | 87%  |
| Received Specialized Care for Burn or Eye Injuries | 8%   | 19%  | 12%  | 4%   | 2%   | 4%     | 2%   | ***  |
| Hospitalized or Transferred to a Hospital          | 3%   | 6%   | 11%  | 8%   | 9%   | 10%    | 14%  | 12%  |
| Died   | 0%   | 0%   | 0%   | 0%   | 1%   | 0%     | 0%   | 0%   |
| <b>Fireworks Circumstances</b>                     |      |      |      |      |      |        |      |      |
| Injuries from Sparklers, Rockets, and Firecrackers | 63%  | 64%  | 57%  | 52%  | 53%  | 52%    | 51%  | 51%  |
| Injuries from Mishandling Fireworks                | 27%  | 23%  | 29%  | 30%  | 28%  | 24%    | 23%  | 26^  |
| Errant Path or Malfunctioning Fireworks            | 21%  | 37%  | 41%  | 35%  | 40%  | 41%    | 43%  | 43%  |

\*\*\* Not reported for 2011

Source: Indiana State Department of Health, Injury Prevention Program